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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

HERTZOG, ARDITH E

ART UNIT

PAPER NUMBER

1754

DATE MAILED: 11/05/2004.

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/812,240

Applicant(s)

BALINGIT, RONALD F. PH

Examiner

Ardith E. Hertzog

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 March 2004 and 17 June 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2 and 5-8 is/are rejected.
- 7) ☒ Claim(s) 3, 4 and 9 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input checked="" type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Pre-Exam Informalities

1. Receipt is acknowledged of applicant's substitute specification (with claims and abstract) filed June 17, 2004, in response to the Pre-Exam Formalities Notice (Formalities Letter) mailed June 10, 2004. Claims 1-9 are pending.

Patent Prosecution Procedure

2. It is respectfully noted that an examination of this application reveals that applicant may be unfamiliar with patent prosecution procedure. While an inventor may prosecute the application, lack of skill in this field usually acts as a liability in affording the maximum protection for the invention disclosed. Applicant is advised to secure the services of a registered patent attorney or agent to prosecute the application, since the value of a patent is largely dependent upon skilled preparation and prosecution. The Office cannot aid in selecting an attorney or agent.

3. Applicant is advised of the availability of the publication "Attorneys and Agents Registered to Practice Before the U.S. Patent and Trademark Office". This publication is for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Title & Abstract

4. The title of the invention is not considered sufficiently descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The following title is suggested for applicant's consideration: PROCESS FOR REMOVING

SULFUR COMPOUNDS AND PARTICULATES FROM A FLUE GAS USING A DRY SCRUBBER/COLLECTOR”.

5. The abstract of the disclosure is objected to, because it appears that one of ordinary skill in the art would have to refer to the specification (in particular, p. 7, the last two paragraphs) in order to fully understand the terminology “the ‘fly-trap’ effect”, as used at line 3 thereof. Appropriate correction is required (see MPEP § 608.01(b), as/if needed, for guidelines re the preparation of patent abstracts).

Specification

6. The specification is objected to, because of the following minor informalities:
- a. On page 4, at line 7, it is suggested that “the particulate trapper” be revised as “the dry scrubber/collector, a.k.a. the particulate trapper”, for clarity, as well as consistency with the rest of the specification.
 - b. On page 4, it is suggested that “in Figures 2 and 3” be inserted after “B. List of Reference Numerals”, for clarity.
 - c. On page 4, the next to last line, this sentence—which describes Figure 1 as showing “said process”—should evidently be deleted, since it appears to contradict the two other lines (specifically, p. 4, line 6 and p. 5, line 14) which describe Figure 1 as showing the chemical reagent and water injection system only (vs. the process as a whole, which further requires the “Particulate Trapper”, as disclosed in the sentence bridging pp. 4-5).
 - d. On page 4, the last line, evidently “5” should be deleted.
 - e. On page 6, line 2, “said” should be revised as “a” (given that the “solid

surface does not appear to be recited earlier in this section of the specification).
Appropriate correction of all the above is required.

Claim Objections

7. Claims 3, 4 and 9 are objected to under 37 CFR § 1.75(c) as being in improper form, because **a multiple dependent claim must refer to other claims in the alternative only** (whereas claims 3 and 4 refer to "Claims 1 **and** 2" (emphasis added), while claim 9 refers to "Claims 1 **and** 8" (emphasis added)). See MPEP § 608.01(n).
Accordingly, claims 3, 4 and 9 have not been further treated on the merits.

Claim Rejections - 35 U.S.C. § 112

8. The following is a quotation of the first paragraph of 35 U.S.C. § 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

9. Claims 1, 2 and 6-8 are rejected under 35 U.S.C. § 112, first paragraph, as based on a disclosure which is not enabling. That the temperature of the solid surface "does not exceed the dew point temperature of the flue gas" (see p. 3, lines 9-10) is evidently critical or essential to the practice of the invention, but such limitation is not included in claims 1, 2 and 6-8. Thus, it is respectfully submitted that these claims are not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). Again, that the temperature of the solid surface "does not exceed the dew point temperature of the flue gas" (see again p. 3, lines 9-10) appears to be a required limitation within applicant's process (see **also** line 3 of the abstract, which discloses "a **cold** solid surface", **as well as** p. 7, the next to last paragraph, especially

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lines 2-3 thereof). Note that incorporating the limitations of claim 5 into the independent claim 1 (being sure to amend/cancel claim 5, as appropriate) would be one means of overcoming this rejection. Appropriate correction is required.

35 U.S.C. 112, Sixth Paragraph

10. The following is a quotation of the sixth paragraph of 35 U.S.C. § 112:

An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

11. As stated in MPEP § 2181 I.:

A claim limitation will be interpreted to invoke 35 U.S.C. § 112, sixth paragraph, if it meets the following 3-prong analysis:

- (A) the claim limitations must use the phrase “means for” or “step for”;
- (B) the “means for” or “step for” must be modified by functional language; and
- (C) the phrase “means for” or “step for” must not be modified by sufficient structure, material or acts for achieving the specified function.

12. **Accordingly** the following claim limitations are interpreted to invoke 35 U.S.C. § 112, sixth paragraph, in this application:

- a. “cooling means” in claim 5;
- b. “cleaning means” in claim 6; and
- c. “injector means” in claim 8.

13. The above claim limitations are thus “construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof”, per 35 U.S.C. § 112, sixth paragraph, as follows:

- a. “Cooling means”, in accordance with:

Said cooling means can be cooling fins for natural draft or forced draft air cooling, a water jacket with a separate radiator, a water jacket connected

to an existing radiator, a water jacket cooled by a refrigerant, and direct cooling with a refrigerant. (p. 6, fourth paragraph from bottom)

- b. "Cleaning means", in accordance with:

Said cleaning means can be a water spray inside said enclosure, positively driven scrapers or wipers inside said enclosure or a combination of the two. (p. 6, third paragraph from the bottom)

- c. "Injector means", in accordance with:

f) said injector means positioned so as to inject said mixture into the dirty gas...

Chemical reagent and water injection systems **are common in the industry** and can be designed and manufactured using known engineering principles and manufacturing processes, respectively. (p. 5, emphasis added)

See also the "Injector Means" of Figure 1.

14. **Therefore**, these three means plus function phrases, as used in claims 5, 6 and 8, are construed to cover those corresponding **specific** embodiments set forth in the citations above, **as well as any equivalent means known in the art**, in accordance with 35 U.S.C. § 112, sixth paragraph.

Claim Rejections - 35 U.S.C. §§ 102 & 103

15. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

16. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set

forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. Claims 1, 2 and 6-8 are rejected under 35 U.S.C. § 102(b) as anticipated by Ashley et al. (US 4,530,822). Ashley et al. teach gas/liquid contact processes considered to meet all material limitations of applicant's claims 1, 2 and 6-8 as follows: Initially, it is noted that Ashley et al. disclose processes of desulphurizing a hot flue gas by spray drying in a tower (see abstract), **and** Ashley et al. specifically discuss removal of the particles which result in such processes (see col. 1, lines 42-55), i.e., processes "for removing sulfur compounds and particulates from a flue gas", per the preamble of applicant's independent claim 1. **In addition:**

The [Ashley et al.] invention provides a method of treating a polluted gas with a liquid, wherein the liquid is directed from an extended surface of a spray device into the polluted gas to cool and/or clean the gas: comprising the steps of (a) continuously providing a film of the liquid on said surface preparatory to directing the liquid from the surface into the gas; and (b) impacting the liquid when it has left the surface with a gaseous stream thereby to produce a spray of liquid droplets for contacting with the polluted gas. (col. 2, lines 46-55)

Note that the above Ashley et al. "liquid" comprises an aqueous solution of sodium carbonate or lime (see col. 2, lines 12-13, as well as Ashley et al. claims 9 and 11), i.e., "a controlled mixture of a chemical reagent and water", per instant claim 1, step a), **and** that the above Ashley et al. "spray device" meets not only the "injecting" limitation of instant claim 1, step a), but also the "injector means" limitation of instant claim 8 (with the Ashley et al. "spray device" considered to fall within the scope of those "systems [that] are common in the industry and can be designed and manufactured using known engineering principles and manufacturing processes, respectively", set forth at instant p.

5, last full paragraph). Ashley et al. **further** teach that the **preferred** desulphurization spray tower apparatus (see Figs. 6-8, noting col. 6, lines 38-43) comprises “[f]our adjustable deflector vanes 161” (see col. 6, line 62 – col. 7, line 8), explaining:

In operation each vane 161 directs a proportion of the gas flowing along the duct 152 inwardly towards the axis of the tower 106 and the gas then passes past the atomizer 109 through the orifice 160 into the interior of the tower 106 as indicated by the arrows in the drawings. (col. 7, lines 9-14)

Note that the above vanes thus operate by “compelling... [the] flue gas to interact with a solid surface”, per instant claim 1, step b), **and** that the vanes are “inside an enclosure”, as required by instant claim 2. Then, in the Ashley et al. evaporative cooling tower embodiment of Figure 9:

Gas to be cooled enters at 210 and leaves at 210a. **Water is sprayed into the tower by an atomizer 209** (as in FIG. 3) and is completely evaporated into the gas to cool it. The arrangement of parts at the top of the tower 206 including an orifice plate 258 and **deflector vanes** (not shown) is the same as at the top of the tower 106, and the description with reference to FIGS. 7 and 8 applies appropriately to the tower 206 as to the tower 106 with corresponding amendment of the reference numerals, as do other appropriate parts of the descriptive matter given hereinabove. (col. 7, line 61 – col. 8, line 4)

Note that with the above, Ashley et al. teach “a cleaning means”, as broadly recited in instant claim 6 (with the Ashley et al. combination of evaporative water and atomizer reading on one of the specific “cleaning means” embodiments—namely, the “water spray inside... [the] enclosure” embodiment—set forth at instant p. 6, third paragraph from bottom). Lastly, Ashley et al. **explicitly** teach:

It is preferred that the gas exiting the tower 6 at 10a be as close to its dewpoint **consistent with maintaining unsaturation at the stack 13**; for example 5° to 15° C. above the dewpoint at 10a. It is believed that this enhances the efficiency of absorption in the tower 6 and also of the bag filter if used at 5. (col. 6, lines 27-32, emphasis added, noting Fig. 4)

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Note that with the above, Ashley et al. at least **inherently** teach the use of “an amount of water which will not cause... [the] flue gas to be supersaturated”, per the first part of instant claim 7; **moreover**, immediately prior to the above, Ashley et al. disclose tailoring the stoichiometric ratio of absorbent to SO₂, dependent upon whether sodium carbonate or lime is used as the absorbent (see col. 6, lines 12- 26), thereby teaching “an amount of chemical reagent which is a function of sulfur compounds in... [the] flue gas”, per the second part of instant claim 7. **Thus**, Ashley et al. **anticipate** instant claims 1, 2 and 6-8, because, as just discussed, processes meeting **all** requirements of these claims of applicant, as broadly recited therein, are taught by this patent.

18. Claim 5 is rejected under 35 U.S.C. § 102(b) as anticipated by **or, in the alternative**, under 35 U.S.C. § 103(a) as obvious over Ashley et al. Ashley et al. are relied upon as just set forth, anticipating processes as recited in applicant’s independent claim 1 (upon which instant claims 5 and 6 both depend). With respect to instant claim 5, the following teaching of Ashley et al. is again noted:

It is preferred that the gas exiting the tower 6 at 10a **be as close to its dewpoint consistent with maintaining unsaturation at the stack 13**; for example 5° to 15° C. above the dewpoint at 10a. It is believed that this enhances the efficiency of absorption in the tower 6 and also of the bag filter if used at 5. (col. 6, lines 27-32, emphasis added, noting Fig. 4)

Note that with the above, Ashley et al. teach the criticality of “the dew point temperature of the flue gas”; **furthermore**, note that in the Ashley et al. evaporative **cooling** tower embodiment of Figure 9:

Gas to be cooled enters at 210 and leaves at 210a. **Water is sprayed into the tower by an atomizer 209 (as in FIG. 3) and is completely evaporated into the gas to cool it.** ...

The gas temperature at 210 is for example 300° C. to 1,000° C. and

the gas temperature at 210a is for example 100° C. to 300° C. (col. 7, lines 61-64, emphasis added; col. 8, lines 7-9)

Note that with the above, Ashley et al. teach “a cooling means”, as broadly recited in instant claim 5 (with the Ashley et al. combination of evaporative water and atomizer considered to be an equivalent of the various specific “cooling means” set forth at instant p. 6, fourth paragraph from bottom). **Thus**, Ashley et al. are **also** considered to anticipate instant claim 5, since the above citations appear to at least **inherently** teach the limitations thereof, i.e., “a cooling means to keep the temperature of... [the] solid surface from exceeding the dew point of the flue gas”. **Alternatively**, it could be assumed *arguendo* that these limitations are not **fully** taught, given that two **separate** Ashley et al. Figures are involved. In this case then, processes falling within the scope of instant claim 5 are considered to have been, **at the least**, *prima facie* obvious to one of ordinary skill in the art, because, as just discussed, Ashley et al. teach the criticality of “the dew point temperature of the flue gas”, **as well as** “a cooling means”, **and** it would have been within the level of ordinary skill to have determined with minimum testing optimal operating parameters of the Ashley et al. processes. When having done so, it is respectfully submitted that, absent contrary evidence, processes falling within the scope of instant claim 5 would have obviously resulted.

Conclusion

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. These references are considered cumulative to or less material than that discussed above. Note that the four US patents discussed in the specification at page 2 have been cited on the enclosed PTO-892 form.

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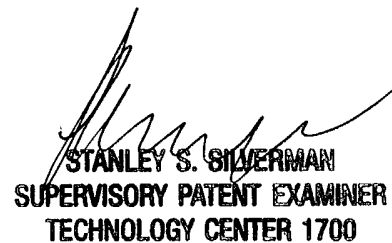
20. Any inquiry concerning this communication should be directed to Ardith E. Hertzog at telephone number (571) 272-1347. The examiner can normally be reached on Monday through Friday (from about 8:00 a.m. - 4:00 p.m., E.S.T.).

21. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley S. Silverman, can be reached at (571) 272-1358. The fax phone number for the organization where this application is assigned is 703-872-9306.

22. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. For any questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


AEH

November 1, 2004


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